C/NOFS, Vector Electric Field Instrument (VEFI)

Rob Pfaff, NASA/GSFC

The Vector Electric Field Instrument (VEFI) consists primarily of three orthogonal 20-m tip-to-tip double probe antennas. VEFI measures DC electric fields that cause the bulk plasma motion that drives the ionospheric plasma unstable. Additionally, it measures the quasi-DC electric fields within the plasma density depletions to reveal the motions of the depletions relative to the background ionosphere. VEFI also measures the vector AC electric field which characterize the microphysics of ionospheric disturbances associated with spread F irregularities. A fluxgate magnetometer, optical lightning detector, and fixed-bias Langmuir probe are also included in the VEFI instrument package.

Please note that the data from some of the VEFI instrument outputs may not be routinely processed and made available in a timely manner. These items are marked below with an asterisk (*).

Measurement Output	Units	Estimated Accuracy	Frequency (Cadence)	Estimated Range of Output Values
DC Electric Field	mV/m	0.3 mV/m	1 Hz	450 mV/m / axis before removing V x B E-field
AC Electric Field				
Broadband	mV/m	0.005 mV/m	512 Hz (nominal survey) 2048, 4096, or 8192 Hz (fast survey)	45 mV/m
Spectrograms	(mV/m)^2 / Hz		1 spectrum/s	0-16 kHz
Filter Bank	(mV/m)^2 / Hz		1.33 Hz	3 Hz - 8 kHz, 12 channels
Fixed Bias Langmuir Probe*	cm^3	5%	16 Hz	10^2 - 10^7 cm^(-3)
Ligthning Detector *			2 Hz, 7 amplitude bins	
Magnetic Field				
DC magnetometer	nT	50 nT Absolute	1 Hz	45,000 nT / axis
AC magnetometer*	nT	0.2 nT relative	16 Hz	900 nT / axis